2-Bay Raid Sub-System

Smart Removable 3.5" SATA Multiple Bay Data Storage Device

User's Manual

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1. How the SteelVine (VPMP-75211R/VPMA-75211R) operates

The VPMP-75211R / VPMA-75211R supports configuration and management of multiple storage devices connected to a single host. Its built-in features include RAID configuration, and virtualization capabilities.

1-1 SteelVine Storage policies

JBOD: A storage policy that grants the host computer direct access to a physical disk drive. With **JBOD** (just a bunch of disks), the number of available virtual drives is equal to the number of physical drives. **JBOD** is also called the bypass mode because the host bypasses the SteelVine virtualization engine to access the drive directly.

SAFE: A storage policy in which all data are stored in duplicate on separate hard disk drives to protect against data loss due to drive failure. At least two hard disk drives mirror each other at all times, equivalent to RAID 1. Every write operation goes to both drives. **SAFE** provides the highest level of data protection, but halves the amount of storage space because all data must be stored twice.

To implement the **SAFE** storage policy, the Basic Configuration Wizard creates two volumes. Each volume consists of two hard disk drives that mirror each other.

BIG: A storage policy configuration in which multiple physical hard disk drives are concatenated and treated as one large volume. This configuration allows the end-user to increase logical volume size beyond the capacity of individual hard disk drives. **BIG** provides the maximum amount of storage space, but no additional performance or data redundancy.

The Basic Configuration Wizard implements the **BIG** storage policy by concatenating all the hard disk drives into a single volume.

FAST: A storage policy in which I/O processing is balanced evenly in a method known as striping, equivalent to RAID 0. Striping increases storage operation speed as each portion of data is divided into segments that are written to different disks sim ultaneously. **FAST** offers the best performance in terms of speed, but has no redundancy of data.

1-2 Prerequisites

The VPMP-75211R/ VPMA-75211R installation has the following hardware and software prerequisites for the host computer(s)

Hardware

- For x86 platforms: An Intel PIII 500MHz equivalent or faster
- For Mac platforms: A Mac G4 500MHz or faster
- CD-ROM drive
- 64 MB of RAM minimum
- 250 MB of free hard disk space
- Super VGA (800 x 600) or higher resolution with 256 colors
- Mouse or compatible pointing device
- External SATA cable connection between the VPMP-75211R/ VPMA-75211R Storage Appliance and the host computer

Software

- Microsoft Windows 2000, Windows XP, or Windows Server 2003 with the latest Service Pack installed.
  For Mac platforms: Mac OS X with the latest set of patches installed.

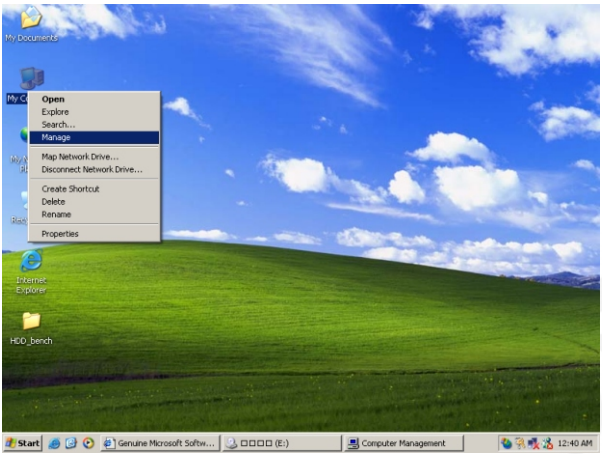
Install the driver

1. Insert the CD into the CD-ROM drive.
2. Click the **Setup** icon in the Windows or Mac directory and follow the Installation Wizard to complete the installation.

2. Getting Started

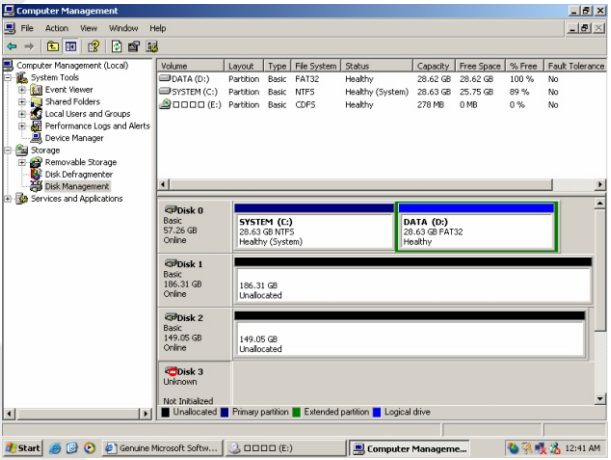
MS Windows

1. Plug the VPMP-75211R / VPMA-75211R Storage Appliance into an AC power outlet and turn the VPMP-75211R / VPMA-75211R power switch to ON.
2. Attach the VPMP-75211R / VPMA-75211R Storage Appliance to the host computer with an external SATA cable.
3. Right-click the **My Computer** icon on your desktop and select **Manage** from the pop-up menu.



4. Click **Disk Management** under **Storage** to view the disk drives.
5. If an **Initialize and Convert Disk Wizard** dialog appears, click **Cancel** to close the Wizard and proceed to **Disk Management**.

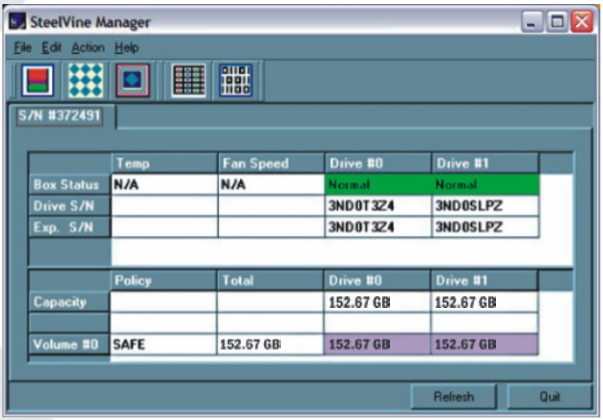
6. Verify that all two drives are visible in their preconfigured and unallocated state.



MS Windows

1. Select the **Start** > **All Programs** > **SteelVine** > **SteelVine Manager** icon to start the Manager.

2. Monitor the status of SteelVine Storage Appliances on the Status window.



3. Select menu options or click toolbar buttons and follow the instructions in the remainder of this guide to configure SteelVine Storage Appliances. When prompted, enter the administrative password. The default password is **admin**.

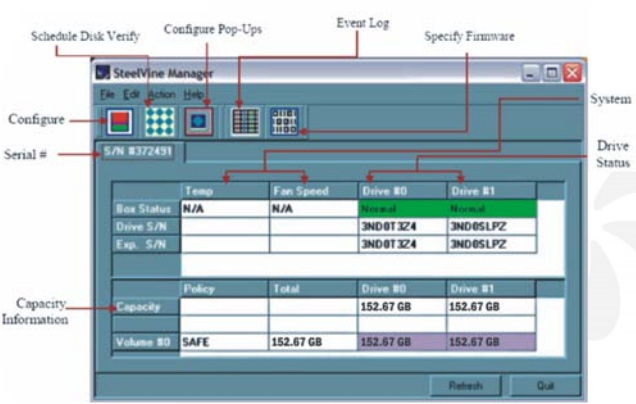
2-1 Start the SteelVine Manager

The SteelVine Manager starts with the Status window visible so you can monitor the SteelVine Storage Appliances. The status only mode is entered when the Rotary switch is in the JBOD, BIG, FAST or SAFE mode. In Status only mode, the user is not allowed to change the configuration from the GUI. The only possible way to change the configuration is to change the Switch setting to in JBOD, Big, Fast or Safe mode

Table 1: Toolbar buttons on the Status Windows.

Button	Tooltip	Description
	Configure Box	Opens the Basic Configuration Wizard. (enabled depending upon config. pin setting)
	Schedule Disk Verify	Schedule a disk Verify activity. (enabled only in SAFE config.)
	Configure Pop-Ups	Configure the Pop-Up messages.
	Show Event Log	View Event Log.
	Specify Firmware	View current version or upgrade Firmware.

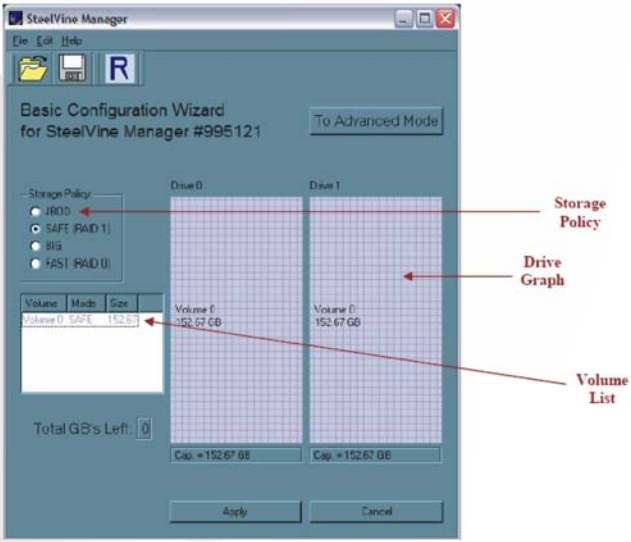
1. Select the **Start > All Programs > SteelVine > SteelVine Manager** icon to start the Manager.
2. Monitor the status of SteelVine storage Appliances on the Status window.



3. Basic Configuration

3-1 A Look at the Basic Configuration Wizard

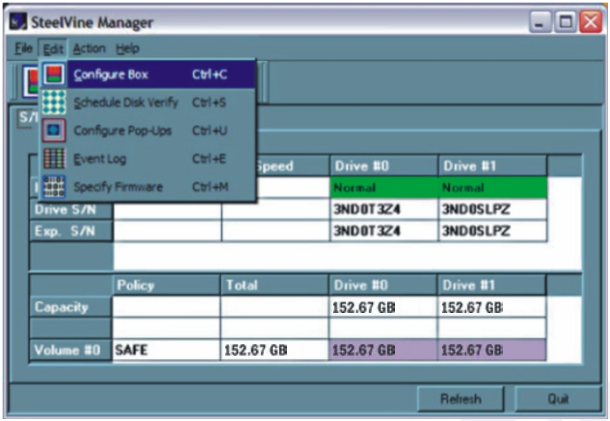
The SteelVine Basic Configuration Wizard is accessible from the Status window and allows volume management. The Basic Configuration Wizard defines volumes based on a selected storage policy. An end-user cannot modify volume counts or capacities. To protect against unintended changes, the SteelVine Manager prompts for a password for first time access of the Wizard. The default password is **admin**.
(See **"Change Password"** for additional information on password management.)



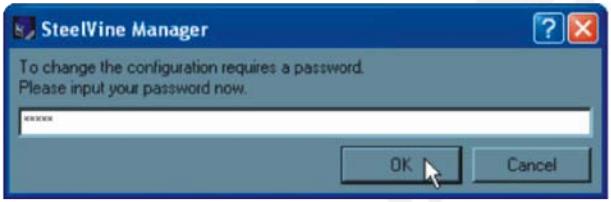
3-2 Configure Volumes

Note: Use the Disk Management utility provided by the OS to delete all VPMP-75211R/ VPMA-75211R partitions except the un-allocated, un-initialized disk that represents the SteelVine processor. See "Partitioning volumes" for details.

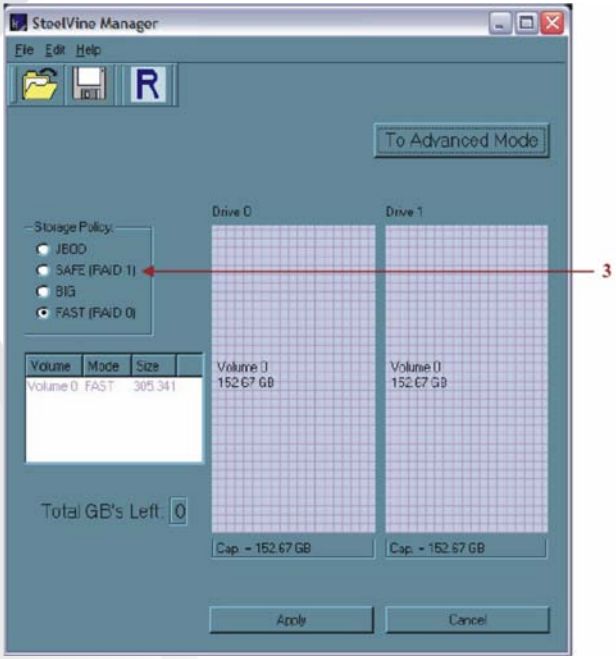
1. Select **Configure Box** from the Edit menu or click the **Configure Box** toolbar button to open the Configuration Wizard.



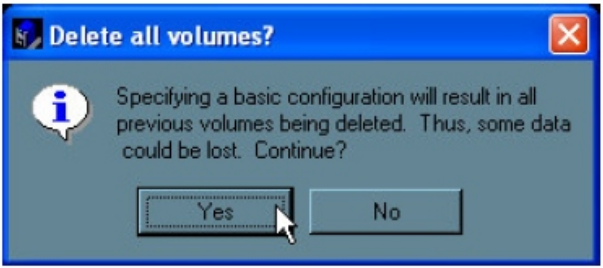
2. When prompted, enter the administrator password. The default password is **admin**.



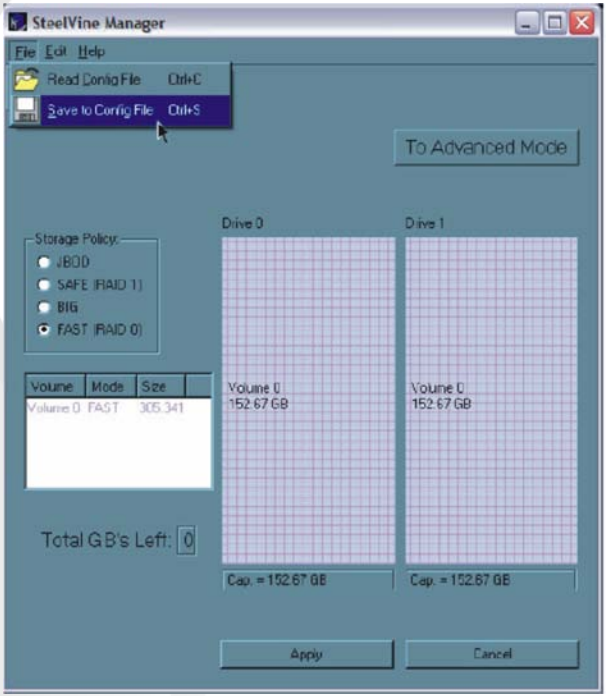
3. Select a storage policy in the **Storage Policy** frame.



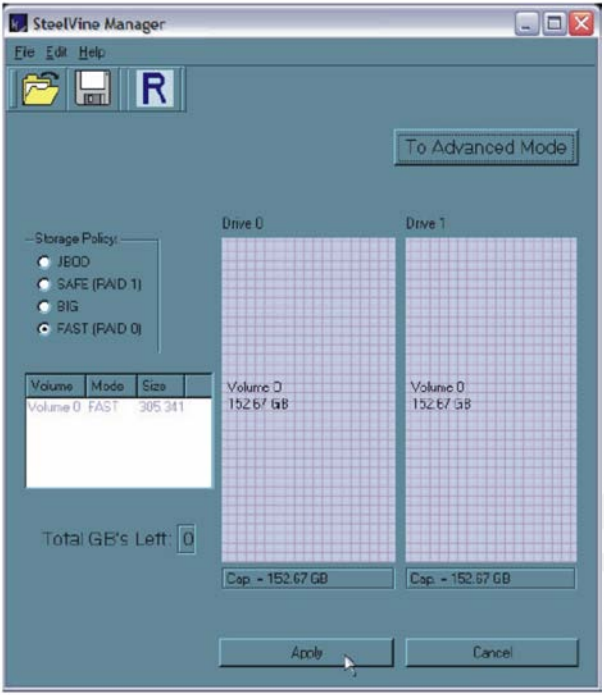
4. When prompted to acknowledge that the configuration change may result in data loss, click **Yes** to accept the configuration.


Delete all volumes?
Specifying a basic configuration will result in all previous volumes being deleted. Thus, some data could be lost. Continue?
Yes
No

5. Select **Save to Config File** from the File menu or click the **Write configuration for system to a file** toolbar button to save the configuration.



6. Click **Apply** to create the selected configuration. The Volume display will close automatically and the Status window will refresh (within a minute or so).



7. Partition the configured volume(s) to complete the implementation.
See "Partitioning Volumes" for details.

4. Advanced Configuration

4-1 Why Advanced Configuration?

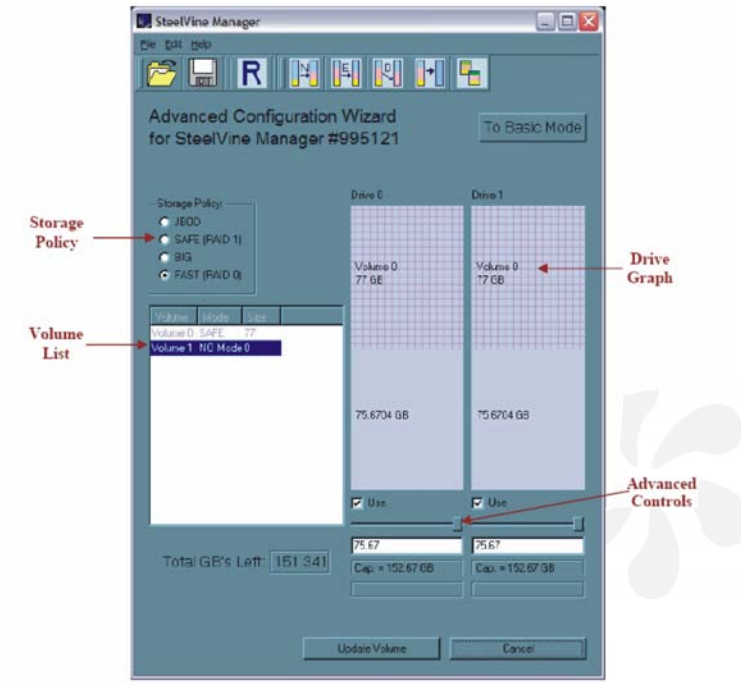
The Basic Configuration Wizard provides six predefined storage policies to quickly configure the VPMP-75211R / VPMA-75211R Storage Appliance. Each predefined storage policy allocates the maximum system capacity to the selected storage policy. Using the Advanced Configuration Wizard, you can configure up to ten volumes - each with different storage policies and capacities. This flexibility provides numerous combinations of performance, redundancy, and capacity to meet your business requirements. For example:

- For applications that produce critical data, redundancy is important. You could use the Basic Configuration Wizard to implement the predefined **SAFE**, **SAFE and FAST**, or **SAFE and BIG** storage policy. This format would allocate all hard disk drives to **SAFE** volumes. This may be excessive for your needs. Use the Advanced Configuration Wizard to create additional volumes and allocate capacity more efficiently.
- For applications that require hundreds of gigabytes of storage space, the added redundancy of a SAFE configuration's Hot Spare may not be an acceptable luxury. Use the Advanced Configuration Wizard to create multiple volumes that make use of every gigabyte of available space.

These are just a few of the possible combinations of storage policy and capacity allocations that you can create with the Advanced Configuration Wizard. Experiment with other combinations to allocate the total system capacity to meet your needs.

4-2 A Look at the Advanced Configuration Wizard

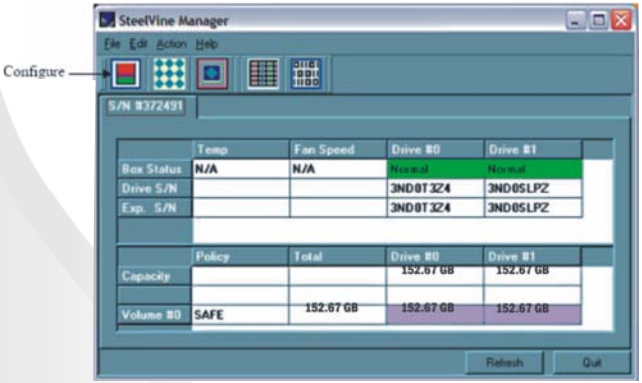
The Advanced Configuration Wizard is an extension of Basic mode that allows you to create two volumes (virtual drives) on each physical hard disk drive.



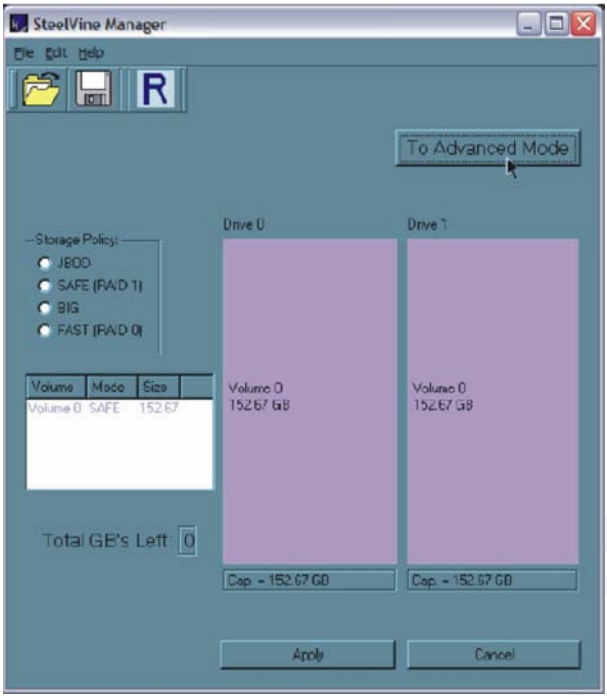
4-3 Configure Multiple Volumes

The Advanced Configuration Wizard allows many combinations of storage policies and capacities. This procedure shows how to modify a basic **SAFE** configuration so that it contains two volumes, one SAFE and one FAST, which use capacity on two drives. The same sequence of steps applies to any combination you choose to implement; only the storage policy and capacity allocation vary for different configuration.

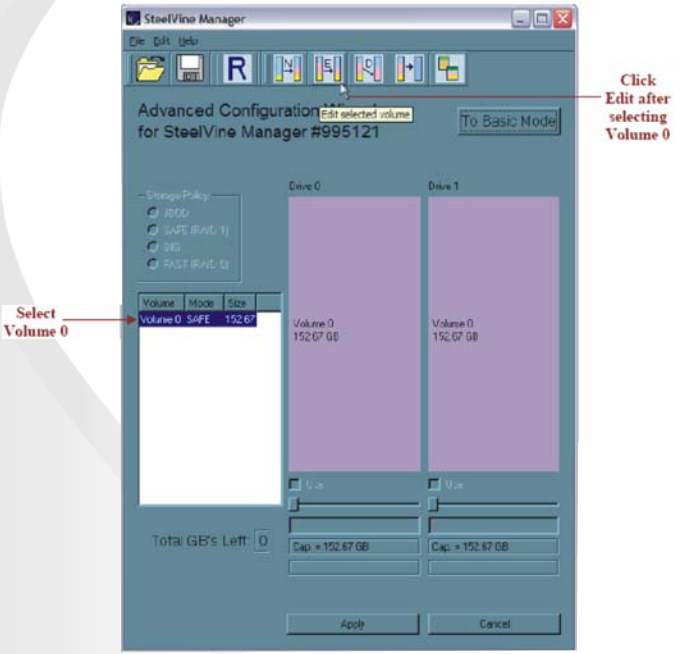
1. Select **Configure Box** from the Edit menu or click the **Configure Box** toolbar button to open the Basic Configuration Wizard.



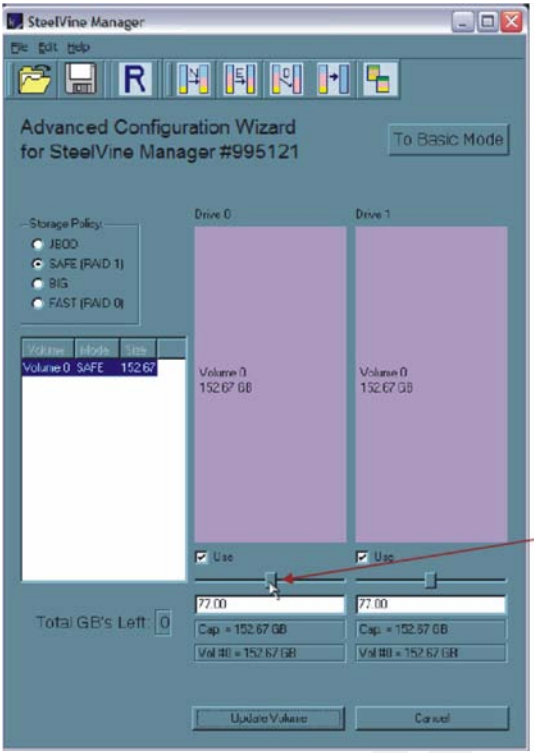
2. Click **To Advanced Mode** to open the Advanced Configuration Wizard.



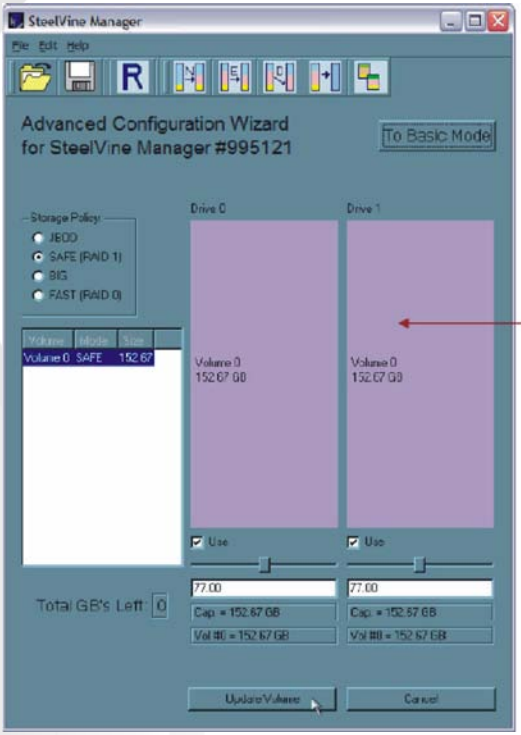
3. Select **Safe** Volume 0 in the volume list and click the **Edit Selected Volume** toolbar button



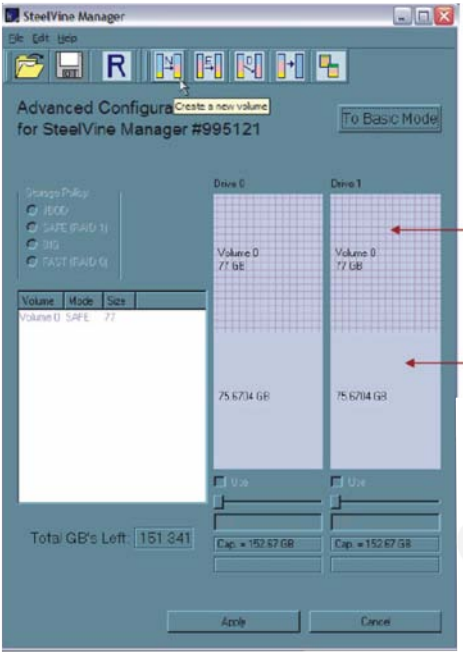
4. Move the slider beneath Drive 0 to the left to change the Safe volume's capacity allocation from the entire hard drive to a portion of the drive. This frees capacity for the second volume.



5. Click **Update Volume**.

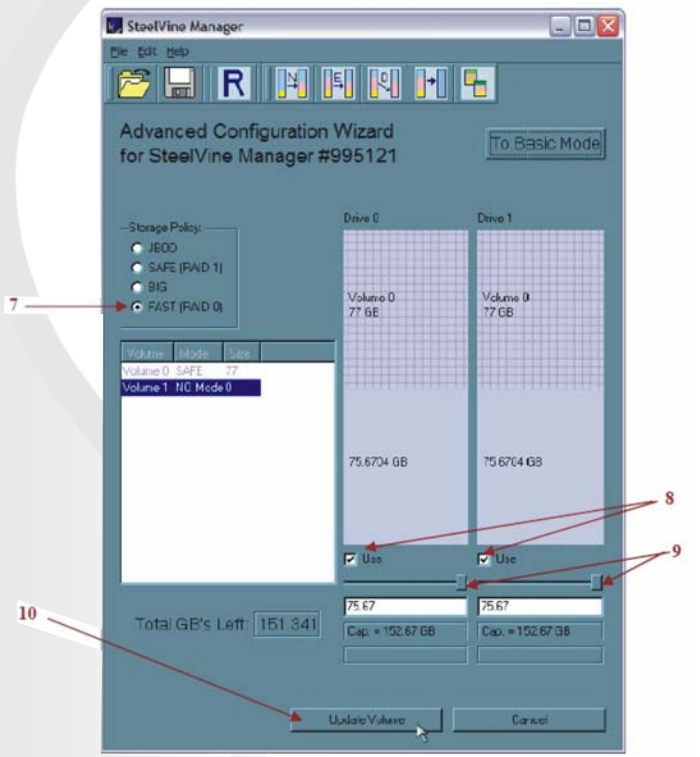


6. Click the **Create a New Volume** toolbar button.

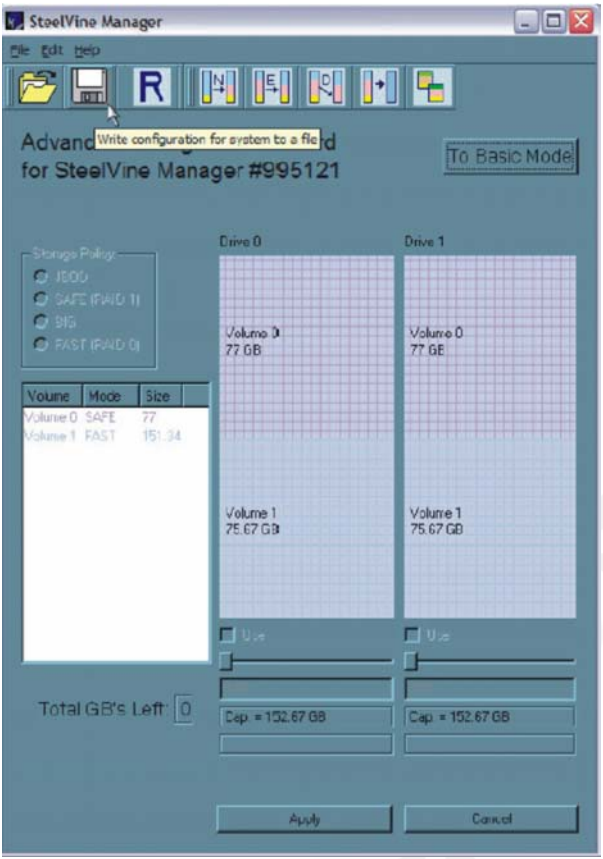


7. Select the **Fast** radio button in the Storage Policy section.
8. Select the **Use** check box beneath both Drive 0 and Drive 1 because Fast volumes are striped across two hard drives.
9. Verify the sliders beneath both drives automatically moved all the way to the right to allocate the remaining capacity on the two drives to the Fast volume.

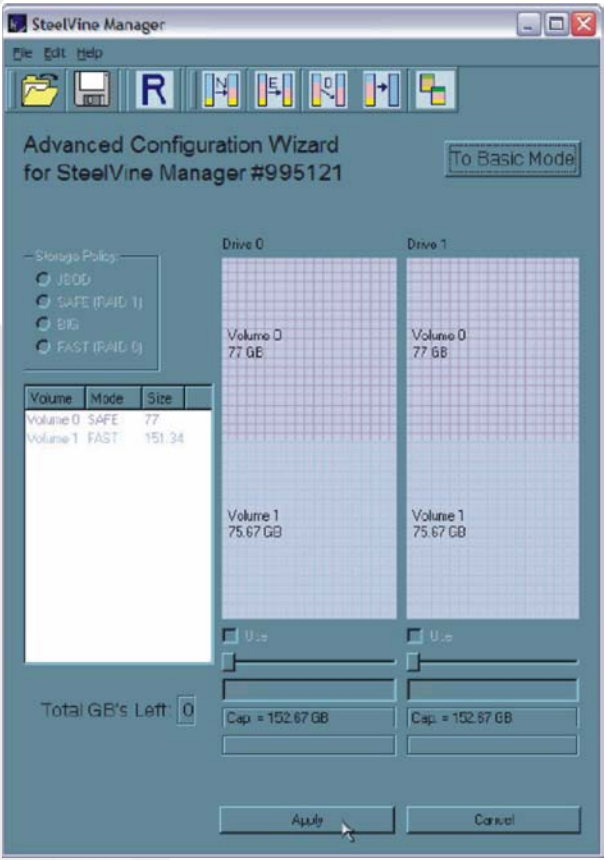
10. Click **Update Volume**.



11. Click **Write Configuration for System to a File** toolbar button to save the configuration.



12. Click **Apply** to create the multi-volume configuration, close the Wizard, and display the volumes in the Status window (within a minute or so)



13. Partition the configured volumes to complete the implementation.
    See Partitioning Volumes for details.

5. Manage Configuration Files

The Basic Configuration Wizard provides menus and icons to manage configuration files.

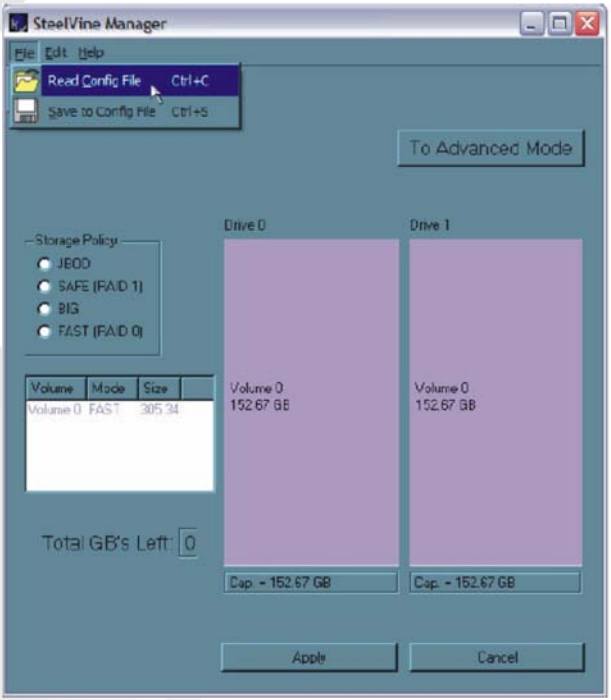
- The **Read Config File** command from the File menu in the Basic Configuration Wizard imports a configuration file so that the end-user can restore a previously saved configuration (storage policy).
- The **Save to Config File** command from the File menu in the Basic Configuration Wizard exports an SteelVine configuration to a file. Each of the procedures in the "Basic Configuration" chapter prompts you to save a configuration file.

5-1 Import a configuration file

Note: The end-user must have previously saved a configuration file so that one is available to import it. See "Save a configuration file" for details.

1. Select **Configure Box** from the Edit menu or click the **Configure Box** toolbar button in the Status window to open the Basic Configuration Wizard.

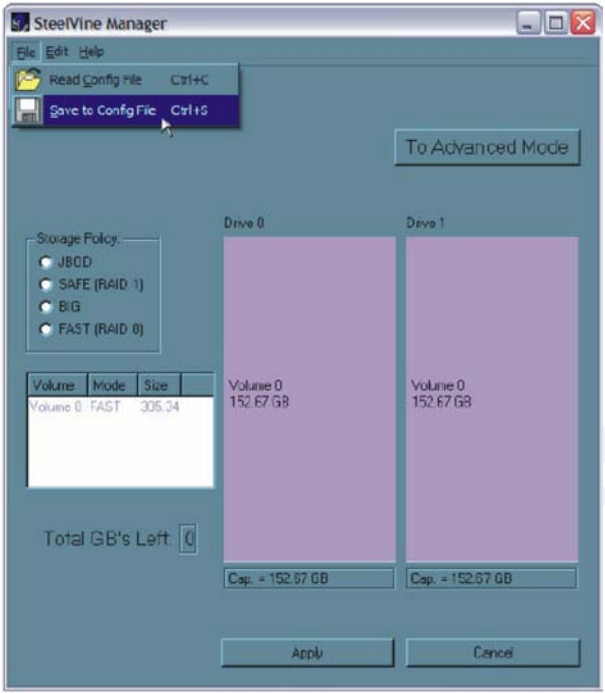
2. Select **Read Config File** from the File menu in the Basic Configuration Wizard.



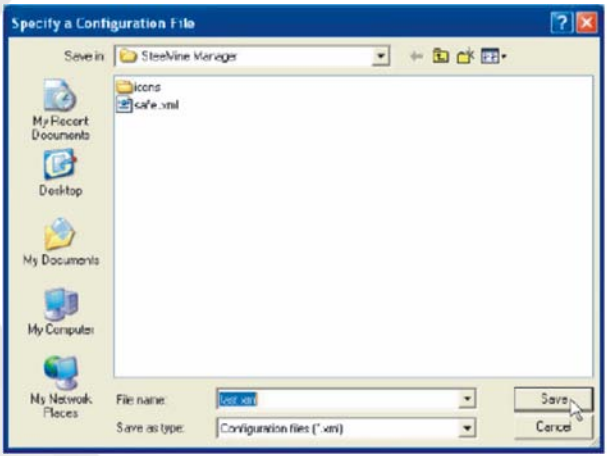
3. Navigate to the required file and click **Open** to import it. The Basic Configuration Wizard provides notice of a successful import and graphically displays the imported volumes.
4. Click **OK** to implement the imported configuration.

5-2 Save a Configuration File

1. Select **Configure Box** from the Edit menu or click the **Configure Box** toolbar button in the Status window to open the Basic Configuration Wizard.
2. Select **Save to Config File** from the File menu in the Basic Configuration Wizard.



3. Navigate to the appropriate directory, specify a file name in the **File Name** text box, and click the **Save** button.



6. Partitioning Configured Volumes

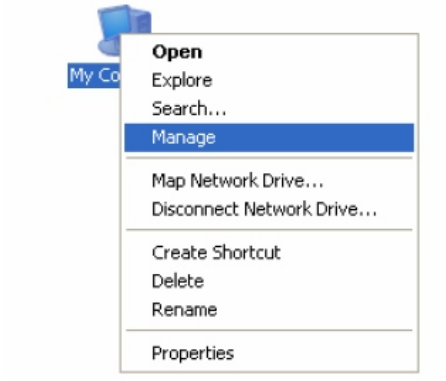
This chapter explains how to partition volumes after configuring them with the SteelVine Manager. The end-user must partition volumes for the host computer's operating system before one can store data on the volumes. Refer to the operating system documentation for further guidance.

6-1 Partition a Volume

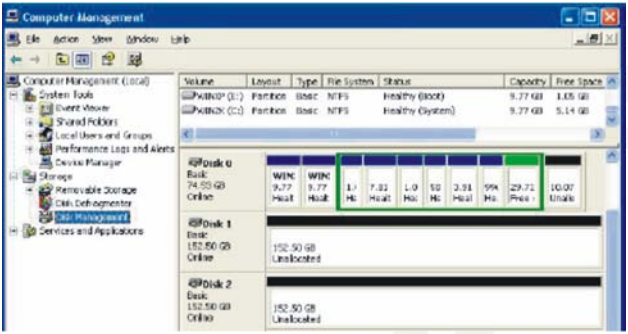
MS Windows

Important: Before reconfiguring a volume, back up the data and delete previously defined SteelVine partitions. Do not, however, delete the partition that represents the SteelVine processor (the "Not Initialized" disk with no capacity allocated to it). After the end-user configures and partitions the new volumes, S/he can restore the backed-up data to the new configuration.

1. Right-click the **My Computer** icon and select **Manage** from the pop-up window.

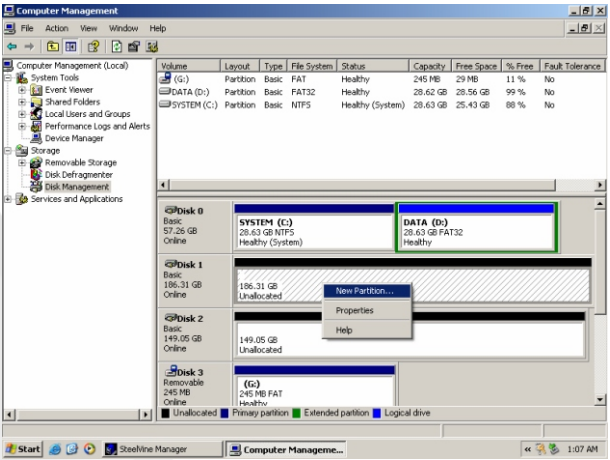


2. From the Computer Management window select **Disk Management** under **Storage** to open Windows Disk Manager.

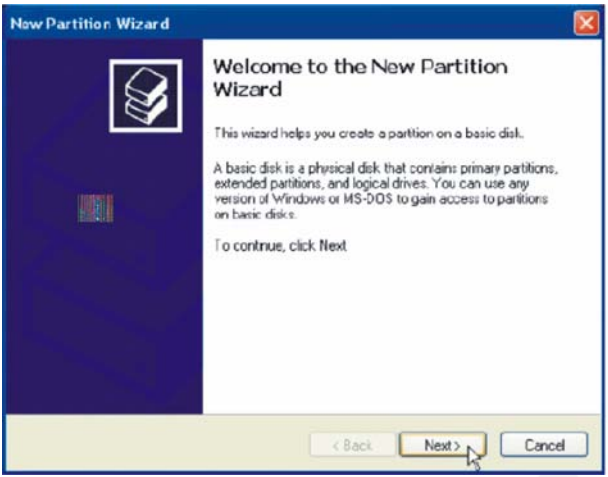


Note: The Disk numbers in the Windows Disk Manager may be different from the Volume numbers shown in the VPMP-75211R/ VPMA-75211R Status window, the Basic Configuration Wizard, and the Advanced Configuration Wizard. Be sure to select the correct disk based on the expected disk capacity to create a partition.

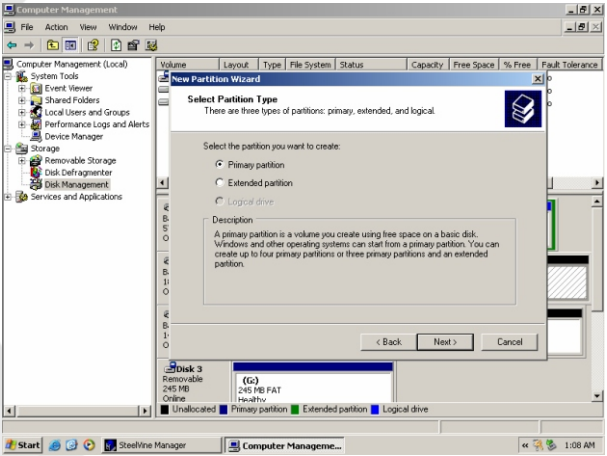
3. Right-click on the configured disk's unallocated space and select **New Partition**. If the New Partition option is not available, select the disk and Initialize it first. To do this, right-click on the disk item and select "Initialize Disk".



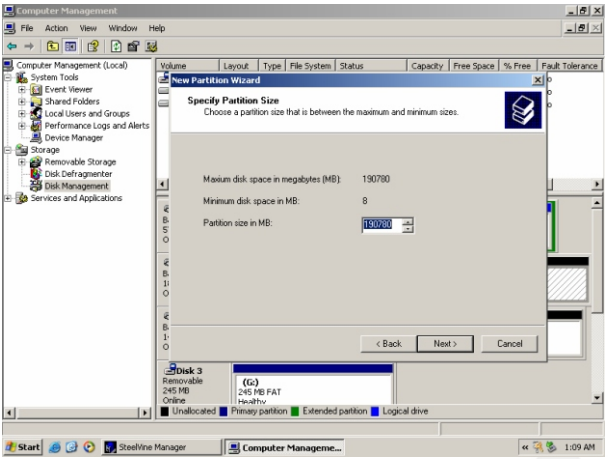
4. Click **Next** to start the Partition Wizard.


New Partition Wizard
Welcome to the New Partition Wizard
This wizard helps you create a partition on a basic disk.
A basic disk is a physical disk that contains primary partitions, extended partitions, and logical drives. You can use any version of Windows or MS-DOS to gain access to partitions on basic disks.
To continue, click Next
< Back
Next >
Cancel

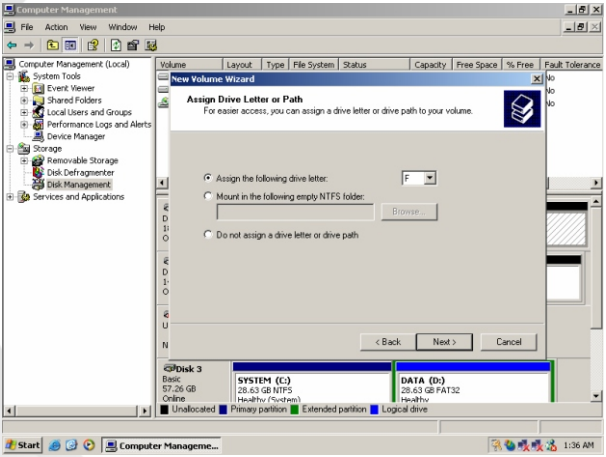
5. Select the Primary or Extended option and click **Next**.



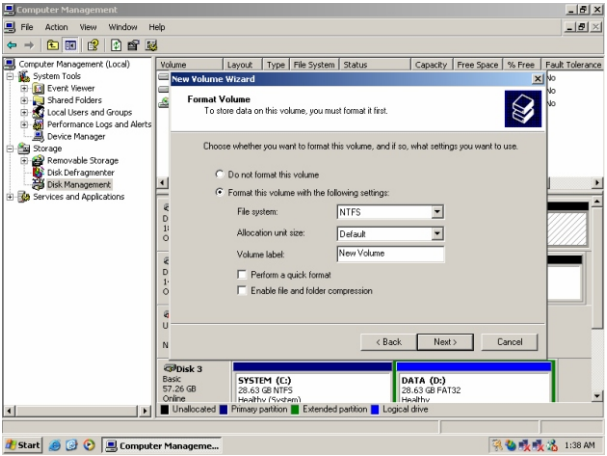
6. Specify the partition size. By default, the partition occupies the entire volume. Click **Next**.



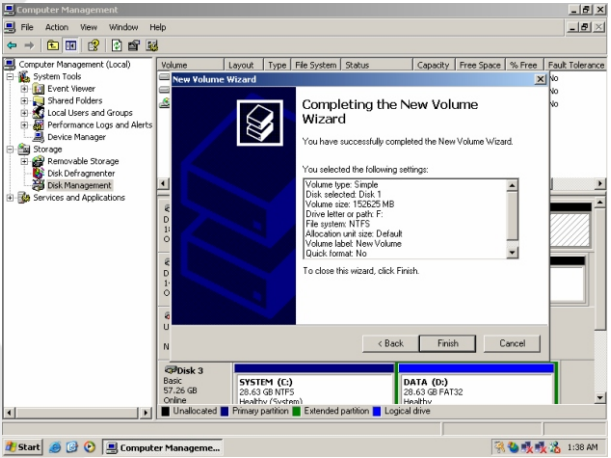
7. Assign a drive letter or mount path and click **Next**.



8. Select file system and name the partition and click **Next**.



9. Review the file system settings and click **Finish** to create the logical partition.



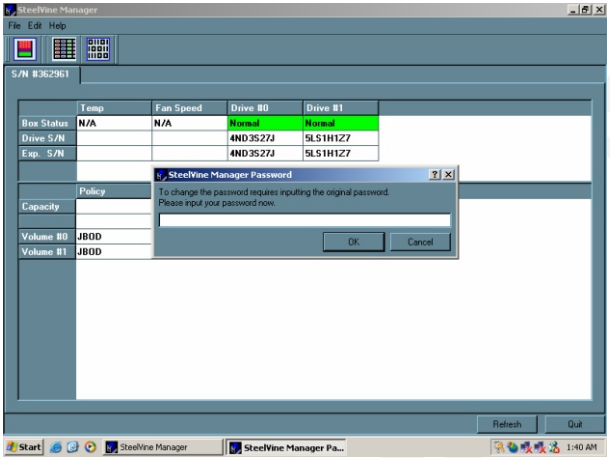
10. Repeat steps 1 through 9 to partition any remaining disks you configured in the Steelvine Manager. Remember, do not partition the disk that represents the SteelVine processor.

7. Change Password

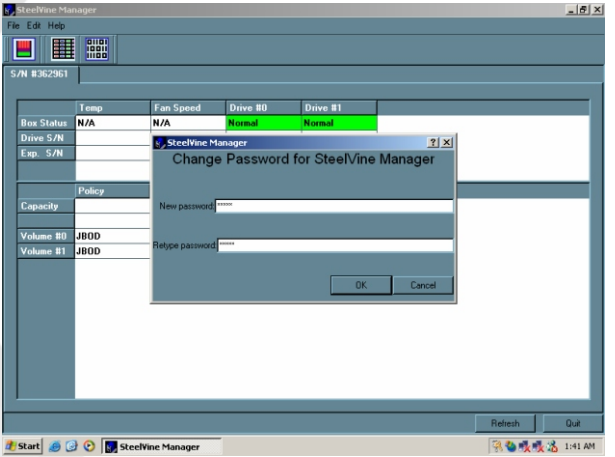
The VPMP-75211R/ VPMA-75211R limits configuration access with a password prompt. The password information is stored locally on the server running the daemon. The default password is admin.

1.Select Change Password from the File menu

2. Enter the current password (or use "dmin" if the default password has not been changed)



3. Enter the new password of 5 or more characters in both fields.

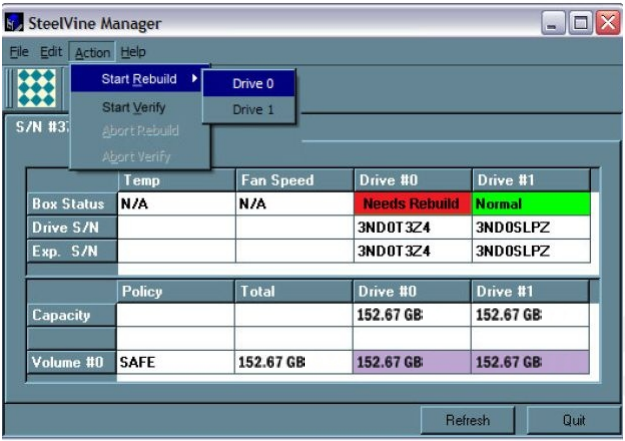


4. Click OK to implement the new password

8. Rebuild

If the hard drive should fail any way, the Stee1Vine Manager is set up to automatically begin rebuild process. Once the Rebuild and Verify operation has been completed, the disk will be available for optimal use.

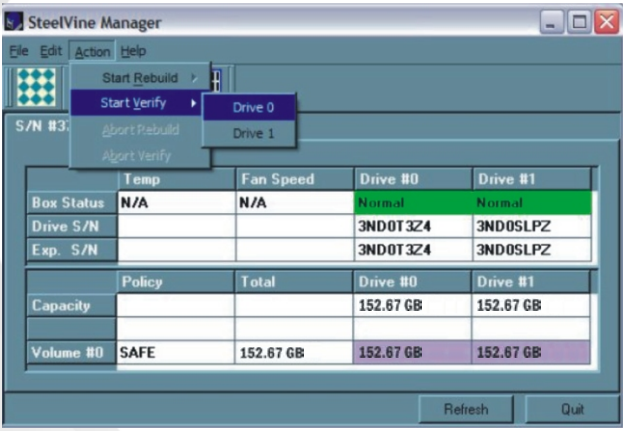
When SAFE (RAID 1) is the selected drive format, the end-user has the option to request a drive rebuild if the disk was marked bad or the rebuild was aborted. Simply select **Action** ->**Start Rebuild** -> **Select Drive 0** or **Dyive 1**. The rebuild process can also be aborted. **A gain. This only applies when applies when the drives have been formatted to SAFE (RAID 1).**



Once the rebuild has taken place, the **Verify** process will begin automatically-provided the GPI pin is set.

8-1 Manually Verify Rebuild

The end-user also has option to execute a Verify Disk task manually.



When the Rigel box is turned on and you select "Start Verify", there is a 60 secod idling performed by the firmware. GUI will disable "Start Verify" during this time. Otherwise, if the drive is normal or verify abort mode, the user has the option to manually start the verify operation.

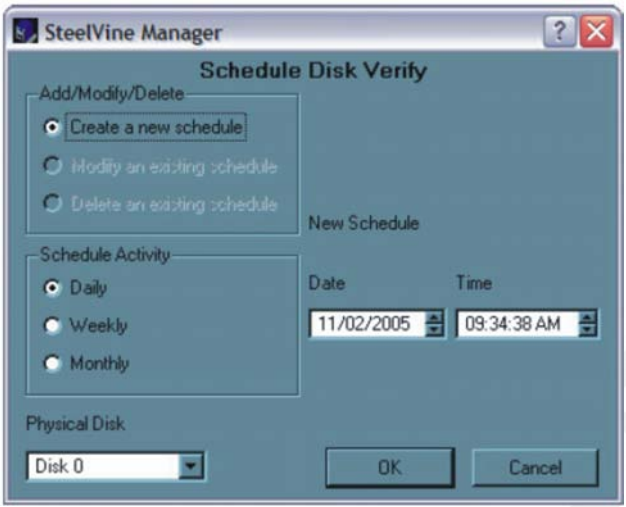
A pop-up will appear informing the end-user of the action taking place.

SteelVine Manager
Box S/N #372491: Verify on the target drive in Slot 0 started, Drive SN 3ND0T3Z4, Drive Model ST3250823AS
OK

8-2 Schedule Disk Verify

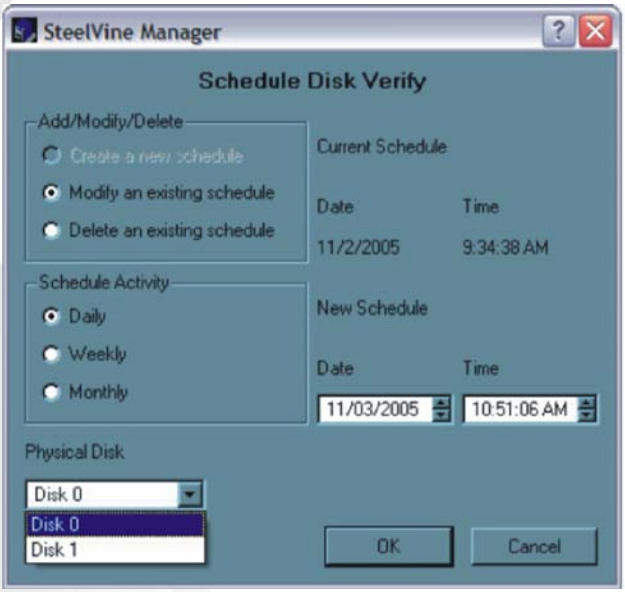
The SteelVine Manager software is set up to automatically verify the rebuild of a disk automatically. However, the end user can also create a vertification schedule at their discretion.

The schedule can be set for daily, weekly, or monthly. The default setting is weekly. It can be customized to run during the off hours so as to not interface with the user's back-up routine. A schedule can be run for each individual hard drive.



8-3 Modify/Delete Verification Schedule

The end user has the option to modify or delete an existing schedule.



9. Pop-up Error Notification

The Error Pop-Up notification can be enabled or disabled by the end user. The default setting is that this feature is enabled and set to display for 30 seconds. The maximum time frame for the message to appear is 60 seconds.

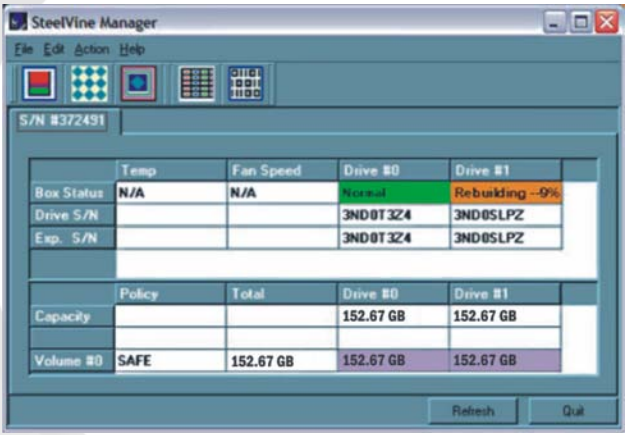
To set the option for manual closure of the pop-op window, set the seconds to "0". This will keep the pop-up window from closing until the end user sees the notice and either clicks on "OK" or "Cancel"

10. Monitoring and Troubleshooting

10-1 Monitor the SteelVine Storage Appliance

Monitor Drive Status

The color of the drivers and the labels in the Status window indicate the status of the drive.



Color Codes and Labels for Driver Status

Color	Label	Definition	Resolution
Green	Normal	Drive is active.	
Gray or Red	Unplugged	Drive is offline. The color is initially gray, and may turn red after writing to a **Safe** volume.	Secure drive in its bay. Replace drive if needed.
Red	Needs Rebuild	Drive is in a failed state. Data was written to a **Safe** volume while the drive was offline.	Replace the failed drive.
	Use Bigger Drive	Drive was replaced with a smaller drive. The appliance is configured with the **Safe**, **Fast**, or **Big** storage policy, and these policies cannot accommodate the smaller drive.	Insert a drive that is the same size as, or bigger than, the original drive.
Yellow (Gold)	Rebuilding or Verifying	Drive is being rebuilt or the rebuild is being verified. A percent complete is provided, too.	
Light Blue	New drive	New drive was installed.	
Purple	Wrong slot	Mismatched **Serial #** and **Expected Serial #** because a drive is installed in the wrong bay.	Install the correct drive into the bay.

Monitor Temperature Status

The SteelVine Storage Appliance uses the following colors to indicate temperature status inside the appliance:

Color	Definition	Resolution
Green	Temperature is normal.	
Yellow	Temperature is greater than 50° Celsius (122° Fahrenheit).	Remove objects that interfere with airflow around the SteelVine Storage Appliance.
Red	Temperature is greater than 53° Celsius (127° Fahrenheit).	Ensure constant airflow around the SteelVine Storage Appliance. If there is no airflow, replace the fan. Identify the drive causing the temperature increase and replace it.

Monitor Fan Status

The SteelVine Storage Appliance uses the following colors and values to indicate fan status.

Color	Value	Definition	Resolution
Green	System + PS	Both system and power supply fans are functioning within limits.	
Red	System	The system fan is not spinning or is spinning slower than expected.	Contact point of sale for repair.
Red	PS	The power supply fan is not spinning or is spinning slower than expected.	
Red	System + PS	Both system and power supply fans are not spinning or are spinning slower than expected.	

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